

Reply to Office Action of March 9, 2006

REMARKS

Upon entry of the instant amendment, claims 1-7 will remain pending in the above-identified application and stand ready for further action on the merits.

The amendments made herein to the claims do not incorporate new matter into the application as originally filed. In support of this contention, it is noted that the amendment made to claim 1, as well as newly added claims 5-6 find support in the original application at page 10, line 16 to page 11, line 15, wherein it is disclosed:

The content of monomer units derived from at least one olefin selected from the group consisting of ethylene and straight α-olefins in the copolymer obtained in the present invention, is preferably 2 to 97 mol%, more preferably 4 to 89 mol%, further preferably 6 to 84 mol%, particularly preferably 9 to 74 mol%, most preferably 14 to 49 mol% based on 100 mol% of the total monomer units of the copolymer from the viewpoint of heightening of transparency and mechanical strength.

The content of monomer units derived from the vinyl compound (I) in the copolymer, is preferably 2 to 97 mol%, more preferably 10 to 95 mol%, further preferably 15 to 93 mol%, particularly preferably 25 to 90 mol%, most preferably 50 to 85 mol% based on 100 mol% of the total monomer units of the copolymer from the viewpoint of heightening of transparency and mechanical strength.

Though the amount to be contained of monomer units derived from the polyene (II) in the copolymer, can be not necessarily determined in general because the content varies depending on the kind thereof, it is preferably 0.0001 mol% or more, more preferably 0.001 mol% or more, further preferably 0.01 mol% or more, particularly preferably 0.02 mol% or more % based on 100 mol% of the total monomer units of the copolymer from the viewpoint of heightening of mechanical strength. Further, it is preferably 10 mol% or less, more preferably 5 mol% or less, further preferably 1 mol% or less and particularly preferably 0.1 mol% or less based on 100 mol% of the total monomer units of the copolymer from the viewpoint of improvement of processability. (Emphasis Added.)

Additionally, newly added claim 7 finds support at page 6, lines 22-23 of the original application, wherein it is disclosed that:

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The polyene (II) having two ethylene bonds is preferably an aliphatic compound....

Accordingly, entry of the instant amendment is respectfully requested at present inasmuch as it does not incorporate new matter into the application as originally filed.

37 CFR § 1.132 Declaration

Enclosed with the instant reply is a 37 CFR § 1.132 Declaration of Mr. Nobuo Oi, one of the present inventors. The Examiner is respectfully requested to review Mr. Oi's declaration at this time, as it is submitted to be relevant to a consideration of the patentability of the pending claims. In Mr. Oi's 37 CFR § 1.132 Declaration, he shows that when 1,5 hexadiene (which is excluded from the scope of specified polyene (II)) was added to ethylene and vinylcyclohexane as the vinyl compound (I) having a bulky substituent in copolymerization, the molecular weight of a ternary copolymer obtained was not high compared to the ethylene-vinylcyclohexane binary copolymer. Thus, Mr. Oi's Declaration supports the fact that the claimed invention provides a result, which cannot be expected, from U.S. Patent 6,288,193 of Iseki et al.

Claim Rejections 35 USC § 103(a)

In the outstanding office action claims 1-4 have been rejected under the provisions of 35 USC § 103(a) as being unpatentable over ***US 6,288,193 to Iseki et al.*** In addition, claims 1-2 and 4 have been rejected under the provisions of 35 USC § 103(a) as being unpatentable over ***US 5,837791 to Sagane et al.***, alone or in view of the evidence provided by ***Oi et al.*** Reconsideration

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and withdraw of each of these rejections is respectfully requested based on the following considerations.

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

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“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Distinctions Over the Cited Art

Iseki US ‘193

U.S. Patent 6,288,193 of Iseki et al. (*Iseki US ‘193*) discloses ethylene-based copolymers such as binary copolymer comprising ethylene and a vinyl compound (A) and ternary copolymer

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comprising ethylene, a vinyl compound (A) and an additional monomer other than the vinyl compound (A)(B). Further, as the additional monomer (B), an α -olefin having 3 to 20 carbon atoms or diolefins having 4-20 carbon atoms are described. In addition, in Examples, an ethylene-vinylcyclohexane-1-hexene copolymer (*see* Examples 1-2, 4-5 and 7), an ethylene-vinylcyclohexane-1-hexene copolymer (*see* Example 3), an ethylene-1-hexene copolymer (*see* Example 6), and an ethylene-1-hexene-1,5-hexadiene copolymer (*see* Example 9) are disclosed.

However, a copolymer comprising an olefin (ethylene and α -olefin having 3-20 carbon atoms), a specific vinyl compound as instantly claimed and a specific diene as instantly claimed are not disclosed in Iseki US ‘193.

In the instantly claimed invention, there can be provided, in a process for producing an olefin-based copolymer containing monomer units derived from a vinyl compound (I) having a bulky substituent, a process providing the olefin-based copolymer of high molecular weight by adding a specified polyene (II), namely, a compound having two or more of ethylene bonds and at least one combination of two ethylene bonds, in which those are bonded to each other through at least three carbon atoms. For example, as apparent from a comparison of the ternary copolymer of Examples in the specification of the above-identified application, with the binary copolymer of Comparative Example 1, when the specific polyene was added to ethylene and vinylcyclohexane, the intrinsic viscosity $[\eta]$ of the obtained ternary copolymer was higher than that of the binary copolymer of ethylene in which the specific polyene was not added.¹

¹ Because the symbol $[\eta]$ is used as an index of molecular weight, the term “molecular weight” instead of the symbol “[η]” is referred to hereinafter.

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On the other hand, when 1,5 hexadiene (which is excluded from the scope of specified polyene (II) in the pending claims) was added to ethylene and vinylcyclohexane as the vinyl compound (I) having a bulky substituent in copolymerization, the molecular weight of a ternary copolymer obtained was not high compared to the ethylene-vinylcyclohexane binary copolymer.

As indicated above, the applicants herewith submit a 37 CFR § 1.132 Declaration of Nobuo Oi, which provides evidence in support of — and as proof of — the above-described fact.

Upon a full review of Mr. Oi's enclosed 37 CFR § 1.132 Declaration, it will be clear to the USPTO that the instantly claimed invention provides a result, which cannot in any way be expected from the disclosure and teaching of Iseki US '193. This is easily ascertained by reviewing data contained in the Table of Mr. Oi's declaration (*see page 4 thereof*).

In Mr. Oi's accompanying declaration, and particularly, in the Table provided therein, the term "insoluble" means that since the molecular weight of the copolymer is too high, the polymer is insoluble in a solvent used for measurement.

Sagane US '791

U.S. Patent 5,837,791 of Sagane et al. (*Sagane US '791*) relates to an unsaturated copolymer containing ethylene (i), an α -olefin (ii) (preferably, propylene, 1-butene, 1-hexene and 1-octene (*see column 6, line 63*)) and triene or tetraene (iii), that is excellent in weathering resistance, and having a high vulcanizing rate. The triene or tetraene (III) is added to obtain a vulcanizable copolymer.

However, the combination of monomers specified in the instant claims is not clearly disclosed in Sagane US '791, and further, Sagane US '791 fails to teach or suggest anything

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about an increase in the molecular weight of an obtained copolymer, by adding the specified polyene (II) to ethylene and the specified vinyl compound (I) in the pending claims.

Moreover, from the above-mentioned description, it is clear that the Iseki US '193 and Sagane US '791 cited art references do *not* provide any motivation that would allow one of ordinary skill in the art to arrive at the instant invention as claimed. Absent such teachings and motivation in the cited art, the outstanding obviousness rejections are not sustainable.

As such, it follows that the invention currently recited in pending claims 1-7 possesses patentability over the cited art of record, including Iseki US '193 and Sagane US '791.

CONCLUSION

Based upon the amendments and remarks presented herein, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of pending claims 1-7 is allowed and patentable under the provisions of Title 35 of the United States Code.

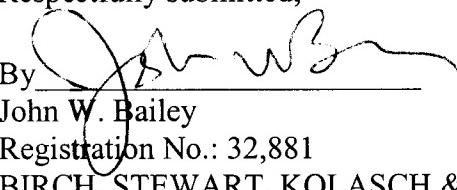
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey (Reg. No. 32,881) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Dated:

Respectfully submitted,

By 

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Enclosure: 37 CFR § 1.132 Declaration of Mr. Nobuo Oi